

Exhibit D

**THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION**

TIERRA INTELECTUAL BORINQUEN,
INC.,

Plaintiff,

V.

HTC CORPORATION, et al.,

Defendants.

TIERRA INTELECTUAL BORINQUEN,
INC.,

Plaintiff,

V.

TOSHIBA CORPORATION, et al.,

Defendants.

CASE NO. 2:13-CV-39-JRG

CASE NO. 2:13-CV-47-JRG

MEMORANDUM OPINION AND ORDER

Before the Court are Plaintiff Tierra Intellectual Borinquen, Inc.’s Opening Claim Construction Brief (Dkt. No. 93), the response of Defendants HTC Corporation, HTC America, Inc. (collectively, “HTC”), Toshiba Corporation, and Toshiba America Information Systems, Inc. (collectively, “Toshiba”) (Dkt. No. 96), and Plaintiff’s reply (Dkt. No. 101).¹

The Court held a claim construction hearing on May 5, 2014.

¹ References to docket numbers are to Civil Action No. 2:13-CV-39 unless otherwise indicated. Also, HTC and Toshiba are referred to collectively herein as “Defendants.”

Table of Contents

I. BACKGROUND.....	3
II. LEGAL PRINCIPLES	4
III. CONSTRUCTION OF AGREED TERMS	7
IV. CONSTRUCTION OF DISPUTED TERMS	8
A. “signal[s]”	8
B. “measurable variable input”	13
C. “signal type”	23
V. CONCLUSION.....	27

I. BACKGROUND

Plaintiff brings suit alleging infringement of United States Patents No. 7,350,078 (“the ‘078 Patent”), 7,725,725 (“the ‘725 Patent”), and 8,429,415 (“the ‘415 Patent”) (collectively, “the patents-in-suit”). The ‘078 Patent is titled “User Selection of Computer Login.” The ‘078 Patent issued on March 25, 2008, bears a filing date of March 4, 2002, and claims priority based on a provisional application filed April 26, 2001. The ‘415 Patent and the ‘725 Patent are titled “User-Selectable Signatures.” The ‘725 Patent issued on May 25, 2010, and bears a filing date of December 23, 2006. The ‘415 Patent issued on April 23, 2013, and bears a filing date of April 13, 2010.

The ‘415 Patent is a continuation of the ‘725 Patent, which in turn is a continuation of the ‘078 Patent. The parties agree, at least for purposes of the present claim construction proceedings, that the specifications of the patents-in-suit are identical except for a discussion of prior art that appears in the Background of the ‘078 Patent (1:21-40) but not in the ‘725 Patent or the ‘415 Patent. (*See* Dkt. No. 93, at 5; Dkt. No. 96, at p. 4 of 24.)² Plaintiff has not challenged Defendants’ apparent position that the additional language in the ‘078 Patent can be considered when construing the disputed terms as to all of the patents-in-suit.

The Abstract of the ‘078 Patent is representative and states:

Computer login may comprise any user-determined submission. A user may select the input devices used, and which types of signals from input devices are to be used for login authentication. Account identification may be inferred by signature rather than explicitly stated. A plurality of discontinuous data blocks in a plurality of files may be employed for validation. The paths to data used in validation may be multifarious, regardless of the prospects for successful authorization.

² Because of incorrect page numbering within Defendants’ response brief, the Court uses the page numbering applied by the Court’s electronic docket.

According to Defendants' response brief, the independent claims asserted by Plaintiff are Claims 1 and 9 of the '078 Patent, Claims 1, 10, and 15 of the '725 Patent, and Claim 1 of the '415 Patent. (Dkt. No. 96, at p. 4 of 24.)

II. LEGAL PRINCIPLES

It is understood that "[a] claim in a patent provides the metes and bounds of the right which the patent confers on the patentee to exclude others from making, using or selling the protected invention." *Burke, Inc. v. Bruno Indep. Living Aids, Inc.*, 183 F.3d 1334, 1340 (Fed. Cir. 1999). Claim construction is clearly an issue of law for the court to decide. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 970-71 (Fed. Cir. 1995) (en banc), *aff'd*, 517 U.S. 370 (1996).

To ascertain the meaning of claims, courts look to three primary sources: the claims, the specification, and the prosecution history. *Markman*, 52 F.3d at 979. The specification must contain a written description of the invention that enables one of ordinary skill in the art to make and use the invention. *Id.* A patent's claims must be read in view of the specification, of which they are a part. *Id.* For claim construction purposes, the description may act as a sort of dictionary, which explains the invention and may define terms used in the claims. *Id.* "One purpose for examining the specification is to determine if the patentee has limited the scope of the claims." *Watts v. XL Sys., Inc.*, 232 F.3d 877, 882 (Fed. Cir. 2000).

Nonetheless, it is the function of the claims, not the specification, to set forth the limits of the patentee's invention. Otherwise, there would be no need for claims. *SRI Int'l v. Matsushita Elec. Corp.*, 775 F.2d 1107, 1121 (Fed. Cir. 1985) (en banc). The patentee is free to be his own lexicographer, but any special definition given to a word must be clearly set forth in the specification. *Intellicall, Inc. v. Phonometrics, Inc.*, 952 F.2d 1384, 1388 (Fed. Cir. 1992).

Although the specification may indicate that certain embodiments are preferred, particular embodiments appearing in the specification will not be read into the claims when the claim language is broader than the embodiments. *Electro Med. Sys., S.A. v. Cooper Life Sciences, Inc.*, 34 F.3d 1048, 1054 (Fed. Cir. 1994).

This Court's claim construction analysis is substantially guided by the Federal Circuit's decision in *Phillips v. AWH Corporation*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). In *Phillips*, the court set forth several guideposts that courts should follow when construing claims. In particular, the court reiterated that "the claims of a patent define the invention to which the patentee is entitled the right to exclude." 415 F.3d at 1312 (quoting *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1115 (Fed. Cir. 2004)). To that end, the words used in a claim are generally given their ordinary and customary meaning. *Id.* The ordinary and customary meaning of a claim term "is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application." *Id.* at 1313. This principle of patent law flows naturally from the recognition that inventors are usually persons who are skilled in the field of the invention and that patents are addressed to, and intended to be read by, others skilled in the particular art. *Id.*

Despite the importance of claim terms, *Phillips* made clear that "the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification." *Id.* Although the claims themselves may provide guidance as to the meaning of particular terms, those terms are part of "a fully integrated written instrument." *Id.* at 1315 (quoting *Markman*, 52 F.3d at 978). Thus, the *Phillips* court emphasized the specification as being the primary basis for construing the claims. *Id.* at 1314-17. As the Supreme Court stated

long ago, “in case of doubt or ambiguity it is proper in all cases to refer back to the descriptive portions of the specification to aid in solving the doubt or in ascertaining the true intent and meaning of the language employed in the claims.” *Bates v. Coe*, 98 U.S. 31, 38 (1878). In addressing the role of the specification, the *Phillips* court quoted with approval its earlier observations from *Renishaw PLC v. Marposs Societa’ per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998):

Ultimately, the interpretation to be given a term can only be determined and confirmed with a full understanding of what the inventors actually invented and intended to envelop with the claim. The construction that stays true to the claim language and most naturally aligns with the patent’s description of the invention will be, in the end, the correct construction.

Phillips, 415 F.3d at 1316. Consequently, *Phillips* emphasized the important role the specification plays in the claim construction process.

The prosecution history also continues to play an important role in claim interpretation. Like the specification, the prosecution history helps to demonstrate how the inventor and the PTO understood the patent. *Id.* at 1317. Because the file history, however, “represents an ongoing negotiation between the PTO and the applicant,” it may lack the clarity of the specification and thus be less useful in claim construction proceedings. *Id.* Nevertheless, the prosecution history is intrinsic evidence that is relevant to the determination of how the inventor understood the invention and whether the inventor limited the invention during prosecution by narrowing the scope of the claims. *Id.*; see *Microsoft Corp. v. Multi-Tech Sys., Inc.*, 357 F.3d 1340, 1350 (Fed. Cir. 2004) (noting that “a patentee’s statements during prosecution, whether relied on by the examiner or not, are relevant to claim interpretation”).

Phillips rejected any claim construction approach that sacrificed the intrinsic record in favor of extrinsic evidence, such as dictionary definitions or expert testimony. The *en banc* court

condemned the suggestion made by *Texas Digital Systems, Inc. v. Telegenix, Inc.*, 308 F.3d 1193 (Fed. Cir. 2002), that a court should discern the ordinary meaning of the claim terms (through dictionaries or otherwise) before resorting to the specification for certain limited purposes. *Phillips*, 415 F.3d at 1319-24. According to *Phillips*, reliance on dictionary definitions at the expense of the specification had the effect of “focus[ing] the inquiry on the abstract meaning of words rather than on the meaning of claim terms within the context of the patent.” *Id.* at 1321. *Phillips* emphasized that the patent system is based on the proposition that the claims cover only the invented subject matter. *Id.*

Phillips does not preclude all uses of dictionaries in claim construction proceedings. Instead, the court assigned dictionaries a role subordinate to the intrinsic record. In doing so, the court emphasized that claim construction issues are not resolved by any magic formula. The court did not impose any particular sequence of steps for a court to follow when it considers disputed claim language. *Id.* at 1323-25. Rather, *Phillips* held that a court must attach the appropriate weight to the intrinsic sources offered in support of a proposed claim construction, bearing in mind the general rule that the claims measure the scope of the patent grant.

III. CONSTRUCTION OF AGREED TERMS

The Court hereby adopts the following agreed constructions:

<u>Term</u>	<u>Agreed Construction</u>
“signature”	“at least one transmission intended as a security precaution to preclude unauthorized access”
“input device”	“a device by which a user enters input into a computer system”
“passively terminating”	“stopping without overt user action when a predetermined condition is met”

“predetermined degree of inexactness”	“a preset allowable measure of deviation from the recorded signal”
“designated tolerance of inexactness”	

(Dkt. No. 89, 2/28/2014 P.R. 4-3 Joint Claim Construction and Prehearing Statement, at 2; Dkt. No. 95, 4/7/2014 Joint Notice of Supplemental Joint Claim Construction Statement, at 1-2.)

The parties have also reached agreement that for the previously-disputed terms “same type” and “a set of related software recognizable data,” “[n]o construction is necessary.” (Dkt. No. 95, at 1; Dkt. No. 96, at p. 8 of 24.)

IV. CONSTRUCTION OF DISPUTED TERMS

Plaintiff filed a Motion to Strike Toshiba’s Expert Declaration (Dkt. No. 102), which was directed to the Declaration of Sandeep Chatterjee, Ph.D. in Support of Toshiba’s Proposed Construction of “Measurable Variable Input” (Dkt. No. 96-4) attached to Defendants’ responsive claim construction brief. Defendant Toshiba filed a response to Plaintiff’s motion to strike. (Dkt. No. 106.) At the beginning of the May 5, 2014 claim construction hearing, the Court denied Plaintiff’s motion. (*See* Dkt. No. 107, 5/5/2014 Minute Entry, at 1.)

A. “signal[s]”

Plaintiff’s Proposed Construction	Defendants’ Proposed Construction
“a set of related software recognizable ³ data which results from user input onto the computer via an ⁴ input device” ⁵	“a set of related software-recognizable data of the same type which results at the termination of a single user input into the computer via the input device” ⁶

³ Plaintiff’s proposal of the phrase “software recognizable” is hyphenated in the parties’ February 28, 2014 Joint Claim Construction and Prehearing Statement but not in Plaintiff’s briefing or in Plaintiff’s proposal in the parties’ April 22, 2014 Joint Claim Construction Chart. (*Compare* Dkt. No. 89, Ex. A, at p. 2 of 14 *with* Dkt. No. 93, at 10, Dkt. No. 101, at 3 & Dkt. No. 105, Ex. A, at 1.) This inconsistency does not appear to be of any significance.

⁴ Plaintiff’s proposal in the parties’ February 28, 2014 Joint Claim Construction and Prehearing Statement and in Plaintiff’s briefing refers to “an” input device. (Dkt. No. 89, Ex. A, at p. 2

(Dkt. No. 93, at 10; Dkt. No. 96, at p. 9 of 24.) The parties submit that this disputed term appears in Claims 1, 2, and 4 of the '078 Patent, Claims 1, 2, 7, 9, 10, 11, 15, 16, 17, and 19 of the '725 Patent, and Claim 1 of the '415 Patent. (Dkt. No. 89, Ex. A, at p. 2 of 14; Dkt. No. 93, at 9 n.2; Dkt. No. 96, at p. 9 n.1 of 24.)

(1) The Parties' Positions

Plaintiff argues that “[a]s described in the specification, a signal: (1) is a set of related software-recognizable data; and (2) results from user input into the computer via one or more input devices.” (Dkt. No. 93, at 10 (citing '078 Patent at 3:16-19 & 3:29-30).) Plaintiff’s other opening arguments addressed Defendants’ previous proposals, noted above, and are no longer pertinent. (*See id.*)

Defendants respond that the claims expressly recite that the related software-recognizable data must be “of the same type.” (Dkt. No. 96, at pp. 9-10 of 24.) As to their proposal of requiring termination of user input, Defendants submit that the specification “makes clear that a signal results upon termination of a transmission, or, in other words, at the termination of user input into the computer via the input device.” (*Id.*, at p. 10 of 24.) Defendants emphasize the disclosure that “[a] signal 2 is a set of related software-recognizable data from a single transmission 1.” (*Id.* (quoting '078 Patent at 3:29-30).)

of 14; Dkt. No. 93, at 9-10; Dkt. No. 101, at 3.) In the parties’ April 22, 2014 Joint Claim Construction Chart, Plaintiff’s proposal refers to “the” input device. (Dkt. No. 105, Ex. A, at 1.) This inconsistency does not appear to be of any significance.

⁵ In the parties’ briefing and joint charts, Plaintiff’s proposed construction included square brackets around “related software recognizable data” and “input device.” At the May 5, 2014 hearing, Plaintiff explained that those square brackets were carried over from disclosures between the parties and have no significance in the present proceedings.

⁶ HTC previously proposed: “Plain and ordinary meaning.” (Dkt. No. 89, Ex. A, at p. 2 of 14.) Toshiba previously proposed: “a set of related software-recognizable data of measureable variable input of the same type from a single transmission.” (*Id.*)

Plaintiff replies that “adding the ‘same type’ limitation to the construction for ‘signal’ would be redundant since the claims in the Asserted Patent already require that signals be of the same type.” (Dkt. No. 101, at 4.) Further, Plaintiff argues, “the only requirement with respect to ‘termination’ is that the termination of the transmission must be recognizable.” (*Id.*, at 5.)

At the May 5, 2014 hearing, Plaintiff clarified that Defendants’ proposal of the phrase “of the same type” is incorrect because that phrase does not appear in Claim 1 of the ‘415 Patent. Plaintiff also urged that Defendants’ proposal of “termination” is incorrect because, Plaintiff argued, input signals exist before a transmission occurs. Plaintiff cited disclosure of “recording mouse 107 movement . . . until sufficient signal 2 has been input to allow a signal match 5” ‘078 Patent at 4:34-37. Defendants responded that signals occur only when a user finishes providing input because measurement is not possible before that time.

(2) Analysis

Claim 1 of the ‘078 Patent is representative and recites (emphasis added):

1. A computer-implemented method for creating a signature for subsequent authentication comprising:
 - indicating to a user commencement of signature input recording;
 - recording user input signals* by type from at least one user-selected device among a plurality of selectable user input devices,
 - wherein a signal comprises a set of related software-recognizable data of the same type received from at least one input device*, and
 - wherein at least one user-selectable input device affords recording a plurality of *signal* types, and
 - wherein a *signal* type comprises a category, among a plurality of possible categories, of measurable variable input associated with at least one user-selectable input device;
 - terminating said recording*;
 - creating a signature based at least in part upon said recording; and
 - storing said signature.

As noted above, the parties agree that a “signal” is “related software-recognizable data” that results from user input into a computer via an input device. Further, Plaintiff acknowledged

in its opening brief that “the plain language of the specification make[s] it clear that a signal is ‘a set of related software-recognizable data from a single transmission.’” (Dkt. No. 93, at 10.)

The above-emphasized claim language also recites that the related software-recognizable data is not merely from the same input device but also is “of the same type.” That limitation appears in all of the relevant claims of the ‘078 Patent and the ‘725 Patent. Nonetheless, because “of the same type” does not appear in Claim 1 of the ‘415 Patent, the Court declines to so limit the generic term “signal.”

The remaining issue, then, is whether a “signal” can result only upon the termination of a single user input. On one hand, the specification appears to suggest that validation can progress before termination of a transmission:

FIG. 16 depicts incremental validation 181: *validation 18 is concurrent with submission 9 transmission 1*. In other words, with incremental validation 181, *validation 18 may progress with each signal 2 or transmission 1*.

* * *

Incremental validation 181 may commence once the first transmission 1 completes, or, in a more sophisticated embodiment, *ongoing 88 with signal input 2*. In a concurrent validation 181 embodiment, initial signal keys may be accumulated 50 and subsequent unmatched keys discarded 51 *concurrent with transmission 1*, on a signal-by-signal 2 basis.

‘078 Patent at 8:47-51 & 8:65-9:4 (emphasis added); *see id.* at 5:34-35 (“In one embodiment, account input 99 captures all transmission 1 signals 2 until actively terminated 78.”).

On the other hand, the specification then explains: “Validation 18 commences by accumulating possible keys 55 based upon signal match 54 between signals 2 of *the first transmission 1* and possible initial signal keys 52. For *subsequent transmissions 1*, accumulated keys are discarded 59 by failure to match signals 57.” *Id.* at 9:5-9. The best reading of these passages as a whole is that the disclosed validation proceeds based upon distinct, completed

transmissions. In other words, the specification does not disclose any validation that occurs mid-transmission.

Further, the specification discloses an embodiment in which termination of a transmission results in a signal, and that signal is a set of data from a single transmission:

A transmission 1 is user input into the computer 100 via one or more input devices 106, *whereupon termination of transmission 1 is recognizable, and resulting in at least one signal 2*. There may be different types 11 of transmissions 1, examples of which include mouse 107 movements or clicks, keyboard 108 entry, or combinations thereof. Other types 11 of transmissions 1 are possible with different input devices 106, such as, for example, voice transmission 1 if the computer 100 is equipped with a microphone and speakers.

Multiple-device 106 transmission 1 m is conceivable. An example of a multiple-device 106 transmission 1 is a combination of mouse 107 movement while one or more keys 108 are pressed, as depicted in FIG. 6.

A signal 2 is a set of related software-recognizable data from a single transmission 1. A plurality of signals 2 of different types 21 may emanate from a single transmission 1. For example, typing a word may yield the signals 2 of entered keys 210 and the timing between keystrokes 211. Another example: mouse 107 movement of the cursor may yield signals 2 of locations 214, velocities, duration; and shape pattern(s) (such as script signatures, drawn characters, and so on) 215.

A transmission 1 of composite signals 2 c comprising a plurality of simple signals 2 s is conceivable. For example, a multiple-device 106 transmission 1 m produces a composite signal 2 c if matching to signals 2 of both devices 106 is required, as does requiring signal match 5 of multiple signal types 21 from a single-device transmission 1.

Signal data 22 may be categorized by its transmission type 11 and/or signal type 21, as depicted in FIG. 5. For easy identification, each possible transmission type 11 or signal type 21 may be assigned a unique ordinal.

Id. at 3:16-47 (emphasis added; “1 m ,” “2 c ,” and “2 s ” italicized as in original).

On balance, however, the claim language does not support requiring that a “signal” must result from the termination of a user input. For example, above-quoted Claim 1 of the ‘078 Patent does not recite termination of a transmission, signal, or input. Instead, the claim recites

“recording user input signals,” “terminating the recording,” and “creating a signature based at least in part upon said recording.” Defendants’ proposal would improperly limit the claims to a disclosed embodiment and is therefore rejected. *Electro Med.*, 34 F.3d at 1054.

Finally, Defendants’ proposal of a “single” user input is unclear and is potentially too limiting, particularly in light of the above-quoted disclosure of a “composite signal.” See ‘078 Patent at 3:40-41.

The Court accordingly hereby construes **“signal”** to mean **“a set of related software-recognizable data which results from user input into the computer via an input device.”**

B. “measurable variable input”

Plaintiff’s Proposed Construction	Defendants’ Proposed Construction
No construction necessary ⁷	<p>HTC: No construction necessary⁸</p> <p>Toshiba: “a variable quantity that can be measured, in contrast to a discrete quantity or condition that can be identified exactly”⁹</p>

(Dkt. No. 93, at 10-11; Dkt. No. 96, at p. 11 of 24.) The parties submit that this disputed term appears in Claims 1 and 9 of the ‘078 Patent, Claims 1, 10, and 15 of the ‘725 Patent, and Claims

⁷ Up until the May 5, 2014 hearing, Plaintiff had proposed: “a quantity, property, or condition that is measurable from an input device.” (Dkt. No. 89, Ex. A, at pp. 3-4 of 14; Dkt. No. 93, at 10; Dkt. No. 101, at 5; Dkt. No. 105, at 8.) Also, as noted below, Plaintiff submitted a new alternative proposal in a written submission after the hearing.

⁸ HTC previously proposed: “Plain and ordinary meaning.” (Dkt. No. 89, Ex. A, at pp. 3-4 of 14.) Also, as noted below, HTC submitted a new alternative proposal in a written submission after the hearing.

⁹ Toshiba previously proposed: “a continuous input that varies over time and can be measured.” (Dkt. No. 89, Ex. A, at p. 4 of 14.) Also, as noted below, Toshiba submitted a new alternative proposal in a written submission after the hearing.

13 and 14 of the '415 Patent. (Dkt. No. 89, Ex. A, at pp. 3-4 of 14; Dkt. No. 93, at 10 n.3; Dkt. No. 96, at p. 11 n.2 of 24.)

(1) The Parties' Positions

Plaintiff argues that “[t]aking into account the myriad of input devices that may be used, it follows that any quantity, property, or condition that an input device is able to measure or that may be derived from the signal received from the input device is a ‘measurable variable input.’” (Dkt. No. 93, at 11.) Plaintiff also argues that “the extrinsic evidence offered by Toshiba does not find support in the specification. For example, the specification does not require input to be ‘continuous’ or that input has to change ‘over time,’” as Toshiba previously proposed. (*Id.*, at 12.) Plaintiff further urges that Toshiba’s extrinsic definitions for “analog computer” and “analog device” are unpersuasive because “the specification does not mention analog computers nor devices, much less limit[] measurable variable input to analog devices.” (*Id.*)

HTC responds that “the words themselves have a plain and ordinary meaning and are easily understood by a jury.” (Dkt. No. 96, at p. 11 of 24.) HTC also argues that Plaintiff’s proposal “reads out the word ‘variable’” and “has improperly construed ‘measurable input’ instead of ‘measurable variable input.’” (*Id.*, at p. 12 of 24.)

Toshiba responds that because the specification does not use “measurable” or “variable,” the meaning “must be inferred from the claims, the context of the invention as described in the specification, and the description of the disclosed embodiments (including relevant figures).” (*Id.*, at pp. 12-13 of 24.) Toshiba submits that the invention is described as using account identification and signatures that are not a keyed-in account name and a keyed-in password, respectively, but rather are one or more signals of a type for which some variability is expected. (*Id.*, at pp. 13-15 of 24.) Toshiba also argues that “the only embodiment described in the

specification supports the distinction between discrete/identifiable input signals (such as keyed-in text characters) and those that are ‘measureable variable’ or ‘difficult-to-exactly-replicate,’” such as “location, speed, vector, or shape.” (*Id.*, at p. 16 of 24.) Further, Toshiba cites the patentee’s discussion (in the Background section of the ’078 Patent) of the “Zilberman” patent as measuring “timing, intervals, and durations of key presses and pauses.” (*Id.*, at p. 17 of 24 (quoting ’078 Patent at 1:21-28).)

Toshiba has also submitted a declaration by its expert, Dr. Sandeep Chatterjee, in support of Toshiba’s proposed construction. (*Id.*, at pp. 17-18 of 24 (citing Dkt. No. 96-4, 4/8/2014 Chatterjee Decl. at ¶¶ 15-24).) Toshiba argues that “[t]o a person of ordinary skill in the art, the phrase ‘measureable variable input’ suggests that the input likely results in an analog signal, which is generally understood as a continuous, variable, measureable quantity,” as opposed to “input that resulted in a digital signal, in other words, a discrete input of 1’s and 0’s that could be exactly identified from the signal as opposed to measured therefrom.” (Dkt. No. 96, at p. 18 of 24.)

Toshiba therefore disagrees with Plaintiff’s position that because different characters may be used, key characters are a “measurable variable input.” (*Id.*, at p. 19 of 24.) Toshiba explains that a particular key character is a discrete, identifiable input, rather than a variable input. (*Id.*) Toshiba concludes that “in light of [Plaintiff’s] apparent position that discrete inputs such as key characters should qualify as ‘measurable variable input, . . . any kind of input would qualify as ‘measurable variable input’” under Plaintiff’s interpretation. (*Id.*, at pp. 19-20 of 24.) Finally, Toshiba argues that Plaintiff’s previously proposed construction “merely repeats the term ‘measurable,’ with no explanation as to what that term means, and fails to account for or explain the term ‘variable.’” (*Id.*, at p. 20 of 24.) In sum, Toshiba proposes that “the simplest and most

informative way to construe ‘measurable variable input’ is by drawing a clear distinction between measureable variable input (*i.e.*, difficult-to-exactly-replicate input that can be measured) and input that is discrete and identifiable without measurement.” (*Id.*)

Plaintiff replies that because Toshiba’s proposal includes the terms “variable” and “discrete,” “Toshiba’s construction would confuse, rather than help the jury. As a result, Toshiba falls prey to the dangers of using extrinsic evidence by arguing an overly complicated position that does not find support in the specification of the Asserted Patents.” (Dkt. No. 101, at 8.)

At the May 5, 2014 hearing, Plaintiff modified its proposal so as to agree with HTC that no construction is necessary. Plaintiff then reiterated that Toshiba’s proposed negative limitation is unsupported and would confuse rather than clarify the scope of the claims. Plaintiff also argued that Toshiba’s proposal is overbroad because whereas the disputed term specifies “input,” Toshiba’s proposal would encompass output.

After the May 5, 2014 hearing, the parties submitted alternative proposed constructions as follows: (1) Plaintiff and HTC propose: “an input that has a property, which is quantifiable through measurement and capable of having more than one possible value” (Dkt. No. 108); and (2) Toshiba proposes: “Measureable characteristics of a user’s input that are inherently inexact. For example, ‘measureable variable input’ from a keyboard could include the measured characteristics of ‘timing, intervals, and durations of key presses and pauses,’ but does not include keyed-in text characters” (Dkt. No. 109).

(2) Analysis

As a threshold matter, although Plaintiff and HTC propose that no construction is necessary, the parties have presented a “fundamental dispute regarding the scope of a claim

term,” and the Court has a duty to resolve that dispute. *O2 Micro Int’l Ltd. v. Beyond Innovation Tech. Co.*, 521 F.3d 1351, 1362-63 (Fed. Cir. 2008).

Claims 10 and 15 of the ‘725 Patent are representative and recite (emphasis added):

10. A computer-implemented process comprising:
commencing signature input recording;
recording user input signals by type from at least one user-selected device
among a plurality of selectable user input devices connected to a single computer,
wherein a signal comprises a set of related software-recognizable data of
the same type received from at least one input device,
wherein a signal type comprises a category of *measurable variable input*
associated with at least one user-selectable input device, and
wherein at least one user-selectable input device affords recording a
plurality of signal types;
terminating said recording;
storing at least a portion of said recording;
creating a signature using said stored recorded user input signals from a
plurality of categories of *measurable variable input*; and
storing said signature.

* * *

15. A computer-implemented method for recording input and creating a signature
comprising:
recording user input signals by type from at least one user-selected device
among a plurality of selectable user input devices connected to a single computer,
wherein a signal comprises a set of related software-recognizable data of
the same type received from at least one input device,
wherein a signal type comprises distinct *measurable variable input*
associated with at least one user-selectable input device, and
wherein recording a plurality of signal types for at least one user-selected
device;
terminating said recording;
storing at least a portion of said recording;
creating a signature based at least in part upon at least a portion of said
stored recording; and
storing said signature.

The claims provide no explicit guidance regarding the meaning of “measurable variable input.” Likewise, the specification does not use this term. As Defendants have submitted, this term was introduced during prosecution when the patentee cancelled all of the original

application claims and presented new claims. (See Dkt. No. 96, Ex. 2, 1/17/2006 Request for Continued Examination, at 2-6 (pp. 3-7 of 65 of Ex. 2).)

The Court therefore considers the specification as a whole for context. The specification discloses that “[h]istorically, an account name would be an identification 3, and a password a signature 4.” ‘078 Patent at 3:5-6. Also of note, the Background section of the ‘078 Patent uses the words “measure” and “measured” when describing a reference that discloses using timing, intervals, and durations of key presses and pauses:

U.S. Pat. No. 6,442,692 [Zilberman] disclosed a special microcontroller embedded within a keyboard. The microcontroller was employed “to *measure certain characteristics* of the user’s keystroke dynamics” independent of the typed text, including the timing, intervals, and durations of key presses and pauses. These *measured characteristics* were then used as integral information for authenticating a user’s identity.

‘078 Patent at 1:21-28 (emphasis added; square brackets in original). The specification then discloses keystroke intervals and mouse movements as examples of inputs:

A transmission 1 is user input into the computer 100 via one or more input devices 106, whereupon termination of transmission 1 is recognizable, and resulting in at least one signal 2. There may be different types 11 of transmissions 1, examples of which include *mouse 107 movements or clicks*, keyboard 108 entry, or combinations thereof. Other types 11 of transmissions 1 are possible with different input devices 106, such as, for example, voice transmission 1 if the computer 100 is equipped with a microphone and speakers.

Multiple-device 106 transmission 1_m is conceivable. An example of a multiple-device 106 transmission 1 is a combination of mouse 107 movement while one or more keys 108 are pressed, as depicted in FIG. 6.

A signal 2 is a set of related software-recognizable data from a single transmission 1. A plurality of signals 2 of different types 21 may emanate from a single transmission 1. For example, typing a word may yield the signals 2 of *entered keys 210 and the timing between keystrokes 211*. Another example: *mouse 107 movement of the cursor may yield signals 2 of locations 214, velocities, duration; and shape pattern(s)* (such as script signatures, drawn characters, and so on) 215.

Id. at 3:16-37 (emphasis added; “1m” italicized as in original); *see id.* at 3:58-61 (“Historically, identification 3 has been a keyed-in account name. Employing the invention, identification 3 comprises at least one signal 2 from at least one transmission 1.”).

As to the constituent term “variable,” the only relevant use of a form of that term, namely “vary,” is in the disclosed example that “mouse click location may *vary* within a radius of 10 pixels and still be tolerated.” *Id.* at 4:19-20 (emphasis added). In other words, a recorded signal and a measured signal can be deemed a “match” so long as they are within a certain “tolerance”:

Historically, validation 18 has required an *absolute signal match* 5 to input 22: for example, *no deviance from a character-based password* has been permitted. *With mouse 107 movements, or other difficult-to-exactly-replicate signals 2, however, some tolerance may be permitted.* Signal 22 tolerance should be allowed when appropriate, and may be set by software-determined protocol or user selection. For example, deviance up to 10% from recorded signal match 5 for keystroke timing 211 may be acceptable. Similarly, as another example, mouse click location may *vary* within a radius of 10 pixels and still be tolerated.

Id. at 4:10-23 (emphasis added); *see also id.* at Cl. 5 (“comparing a subsequent signature submission to said recording, and accepting said comparison within a predetermined degree of inexactness”) & Cl. 13 (similar as to “designated tolerance of inexactness”).

These disclosures, as well as the above-quoted contrast between prior art passwords and the disclosed examples of timing, movement, and patterns, are consistent with Defendants’ position that whereas user input of a particular key character always produces the same signal, a “measureable variable input” signal must be measured and evaluated.

Along these lines, Toshiba’s expert, Dr. Chatterjee, has placed heavy emphasis on the constituent term “measureable,” opining:

[I]f a quantity were discrete, then it would not need to be measured; it could simply be identified. Therefore, it is my opinion that the word “measureable” in the term “measureable variable input” is significant, and distinguishes it from other types of input, i.e. discrete inputs. * * *

[A] discrete character-based password is readily identifiable by a computer and would not require “measurement” to identify the characters.

(Dkt. No. 96-4, 4/8/2014 Chatterjee Decl., at ¶¶ 22-23.) Although expert opinions regarding claim construction generally carry limited weight, Dr. Chatterjee’s opinions can be considered. *See Phillips*, 415 F.3d at 1318 (“We have also held that extrinsic evidence in the form of expert testimony can be useful to a court for a variety of purposes, such as to provide background on the technology at issue, to explain how an invention works, [and] to ensure that the court’s understanding of the technical aspects of the patent is consistent with that of a person of skill in the art . . .”).

Defendants have likewise submitted extrinsic dictionary definitions to show that a “variable” input is an input that can vary, such as an analog input. Although this extrinsic evidence must be considered with care, “[d]ictionaries or comparable sources are often useful to assist in understanding the commonly understood meaning of words.” *Id.* at 1322.

Specifically, Toshiba submits that “variable” means “able or apt to vary; subject to variation or changes; characterized by variations.” (Dkt. No. 96, Ex. B, *Merriam Webster’s Collegiate Dictionary* 1306 (10th ed. 1999) (DEFTIB00001002); *see id.*, at 1307 (DEFTIB00001003) (“vary” means “to make a partial change in : make different in some attribute or characteristic”).) Toshiba also submits that “measure” means “the dimensions, capacity, or amount of something ascertained by measuring,” “an estimate of what is to be expected (as of a person or situation),” and “a measured quantity.” (*Id.*, at 720 (DEFTIB00000998).) Defendants further submit a technical dictionary definition of “input” as meaning “the information that is delivered to a data-processing device from the external world, the process of delivering this data, or the equipment that performs this process.” (*Id.*, Ex. C,

McGraw-Hill Dictionary of Scientific and Technical Terms 967 (4th ed. 1989)
(DEFTIB00000987).)

In connection with Toshiba’s suggestion that “the phrase ‘measureable variable input’ suggests that the input likely results in an analog signal, which is generally understood as a continuous, variable, measureable quantity” (Dkt. No. 96, at p. 18 of 24), Toshiba submits that “analog” is defined as “[o]f, relating to, or being a device in which data are represented by variable measurable physical quantities.” (Dkt. No. 96, Ex. G, *Webster’s II New College Dictionary* 40 (1999) (DEFTIB00001589); *see id.*, Ex. H, *Microsoft Computer Dictionary* 26 (5th ed. 2002) (DEFTIB00001586) (“Pertaining to or being a device or signal that is continuously varying in strength or quantity, such as voltage or audio, rather than based on discrete units, such as the binary digits 1 and 0. A lighting dimmer switch is an analog device because it is not based on absolute settings.”).) “Analog computer” is similarly defined as “a computer that operates with numbers represented by directly measurable quantities (as voltages or rotations).” (*Id.*, Ex. F, *Merriam Webster’s Collegiate Dictionary* 41 (10th ed. 1994) (DEFTIB00001583); *see id.*, Ex. D, *Random House Kernerman Webster’s College Dictionary* (2010) (DEFTIB00001593) (“a computer that represents data by measurable quantities, as voltages, rather than by numbers”).)

These extrinsic dictionary definitions are of limited weight, however, as explained by *Phillips*. 415 F.3d at 1321 (“[H]eavy reliance on the dictionary divorced from the intrinsic evidence risks transforming the meaning of the claim term to the artisan into the meaning of the term in the abstract, out of its particular context, which is the specification.”).

As to Toshiba’s proposal of “a variable quantity that can be measured, in contrast to a discrete quantity or condition that can be identified exactly,” the meaning of “discrete quantity or

condition” is unclear. Even if that phrase were deemed fully described by the subsequent phrase “that can be identified exactly,” Toshiba’s proposal is inconsistent with the disclosed embodiments. For example, the above-quoted examples of keystroke timing and mouse movements presumably may be “identified exactly” (to whatever extent permitted by those input devices) but are expected to differ slightly from recorded signals. *See* ‘078 Patent at 4:10-23. Toshiba’s proposal to exclude that which can be “identified exactly” would thus exclude the preferred embodiments. To do so would be disfavored. *See Vitronics Corp. v. Conceptronic Inc.*, 90 F.3d 1576, 1582-83 (Fed. Cir. 1996) (noting that a claim interpretation in which the only embodiment or a preferred embodiment “would not fall within the scope of the patent claim . . . is rarely, if ever, correct and would require highly persuasive evidentiary support”).

As to the parties’ above-mentioned alternative proposed constructions submitted after the hearing, the proposal by Plaintiff and HTC is overbroad, potentially encompassing any input, and the proposal by Toshiba specifically excludes key characters but does little else. Toshiba’s proposal may also introduce confusion as to what is “inherently” inexact. Finally, to whatever extent any of Toshiba’s proposals demand that a “measurable variable input” must be an analog input, the Court expressly rejects such proposals as lacking support in the intrinsic evidence.

Instead, the significance of being “measurable” is evident from the above-quoted portion of the Background section of the ‘078 Patent, which discloses that “measured characteristics” are different from distinctly identifiable inputs such as key characters. *See* ‘078 Patent at 1:21-28. Plaintiff’s opening brief appears to acknowledge this distinction. (*See* Dkt. No. 93, at 15 (noting that “passwords and passphrases . . . generally do not allow any type of deviation”).) This distinction—coupled with the above-quoted intrinsic and extrinsic evidence that a “variable” input produces a signal that is measured and that can be deemed to match a recorded signal

despite some variation between the measured signal and the recorded signal—should be given effect together with finding that a “measurable variable input” is an input quantity that can vary and that must be measured.

The Court therefore hereby construes **“measurable variable input”** to mean **“an input quantity that can vary and that must be measured, as opposed to an input that is distinctly identifiable.”**

C. “signal type”

Plaintiff’s Proposed Construction	Defendants’ Proposed Construction
“a category of measurable variable input associated with at least one user-selectable input device” ¹⁰	“a category of measurable variable input associated with the signal received from at least one user-selectable input device” ¹¹

(Dkt. No. 93, at 12-13; Dkt. No. 96, at p. 21 of 24.) The parties submit that this disputed term appears in Claims 1, 3, 9, 12, and 15 of the ’078 Patent, Claims 1, 7, 10, 11, 15, 16, and 17 of the ’725 Patent, and Claims 1, 12, 13, and 14 of the ’415 Patent. (Dkt. No. 89, Ex. A, at p. 1 of 14; Dkt. No. 93, at 12 n.4; Dkt. No. 96, at p. 21 n.5 of 24.)

(1) The Parties’ Positions

Plaintiff’s opening arguments addressed Defendants’ previously proposed constructions and are no longer pertinent. (*See* Dkt. No. 93, at 13-14; Dkt. No. 96, at p. 21 of 24.)

¹⁰ In the parties’ briefing and joint charts, Plaintiff’s proposed construction included square brackets around “measurable variable input” and “input device.” At the May 5, 2014 hearing, Plaintiff explained that those square brackets were carried over from disclosures between the parties and have no significance in the present proceedings.

¹¹ HTC previously proposed: “a set of software recognizable data of the same category of measurable variable input associated with at least one user-selectable input device.” (Dkt. No. 89, Ex. A, at p. 1 of 14.) Toshiba previously proposed: “a type of measurable variable input associated with at least one user-selectable input device.” (*Id.*)

Defendants respond by agreeing with Plaintiff that “the term ‘signal type’ should be construed the same way for all three patents-in-suit.” (Dkt. No. 96, at p. 21 of 24.) Defendants also submit that the parties agree that a “signal type” is “a category of measurable variable input,” as recited by the claims. (*Id.*) Defendants argue:

Defendants’ proposed construction gives meaning to the patentee’s clear distinction between signal types and transmission types. Indeed, Defendant[s]’ construction clarifies for the jury that a “signal type” is associated with the signal, as opposed to the transmission. Moreover, Defendant[s]’ proposed construction clarifies that the claimed association between the measurable variable input and the user-selectable input device requires that the measurable variable input be received from the input device.

(*Id.*, at p. 22 of 24.) Defendants conclude that “the ‘measurable variable input’ must be ‘received from the input device,’ such that a signal of a distinct signal type results at the termination of the input, or at the termination of the transmission.” (*Id.*)

Plaintiff replies that “it is not clear from Defendants’ proposed construction whether it is the ‘category’ that is received or the ‘signal’ that is received from the at least one user selectable input device.” (Dkt. No. 101, at 10.) Plaintiff submits that “it is readily apparent that ‘signal type’ is related to ‘signal’ and that no clarification is required as it is unlikely that the jury will be confused by ‘signal type’ and ‘transmission type.’” (*Id.*)

(2) Analysis

Claim 1 of the ‘078 Patent and Claim 1 of the ‘415 Patent are representative and recite (emphasis added):

1. A computer-implemented method for creating a signature for subsequent authentication comprising:
 - indicating to a user commencement of signature input recording;
 - recording user input signals by type from at least one user-selected device among a plurality of selectable user input devices,
 - wherein a signal comprises a set of related software-recognizable data of the same type *received from at least one input device*, and

wherein at least one user-selectable input device affords recording a plurality of *signal types*, and
 wherein a signal type comprises a category, among a plurality of possible categories, of measurable variable input associated with at least one user-selectable input device;
 terminating said recording;
 creating a signature based at least in part upon said recording; and
 storing said signature.

* * *

1. A computing device which provides secured access, the computing device comprising:

 a program memory;
 a data storage memory;

 first and second input devices both of which are part of the computing device and are selectable by a user via the computing device to allow the user to generate a reference signature that can be compared to a future submitted signature for authentication purposes to allow it to be determined whether access to the computing device should be granted based on the user selection, wherein at least one of the first and second user selectable input devices is of a type of input device other than a keyboard;

 a processor operatively interfaced with the program memory, the data storage memory, and the first and second user selectable input devices;

 a first set of instructions stored in the program memory that, when executed by the processor, allow a user to select at least one *signal type*, among at least two different user selectable *signal types*, to be received and stored in the memory, the at least two different *signal types* being associated with the first or second user selectable input devices;

 a second set of instructions stored in the memory that are adapted to be executed after the first set of instructions has been executed, the second set of instructions, when executed by the processor, causing

- (a) input data of at least one *signal type* from the user selected one of the first and second input devices to be generated and then recorded in the data storage memory,
- (b) a reference signature to be created which comprises in part at least a portion of the input data recorded in the data storage memory, and
- (c) the reference signature to be stored in the data storage memory; and

 a third set of instructions stored in the program memory that are adapted to be executed after both the first and second sets of instructions have been executed, the third set of instructions, when executed by the processor, retrieving the reference signature from the data storage memory and comparing it to a subsequent signature submission *signal* to allow a determination to be made as to whether or not access to the computing device should be granted.

The specification discloses multiple transmission types as well as multiple signal types:

A transmission 1 is user input into the computer 100 via one or more input devices 106, whereupon termination of transmission 1 is recognizable, and resulting in at least one signal 2. There may be *different types 11 of transmissions 1*, examples of which include mouse 107 movements or clicks, keyboard 108 entry, or combinations thereof.

* * *

A plurality of signals 2 of different types 21 may emanate from a single transmission 1. For example, typing a word may yield the signals 2 of entered keys 210 and the timing between keystrokes 211. Another example: mouse 107 movement of the cursor may yield signals 2 of locations 214, velocities, duration; and shape pattern(s) (such as script signatures, drawn characters, and so on) 215.

A transmission 1 of composite signals 2c comprising a plurality of simple signals 2s is conceivable. For example, a multiple-device 106 transmission 1m produces a composite signal 2c if matching to signals 2 of both devices 106 is required, as does requiring signal match 5 of *multiple signal types 21 from a single-device transmission 1*.

‘078 Patent at 3:16-21 & 3:30-43 (emphasis added; “1m,” “2c,” and “2s” italicized as in original). Figure 10 illustrates “signal types” that “the user may select” (*see id.* at 5:1-19):

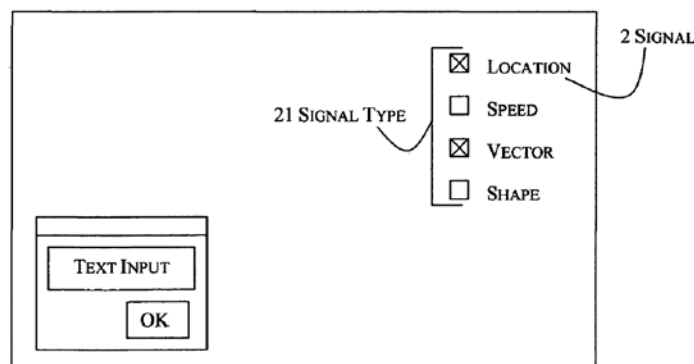


FIGURE 10

On balance, even though Claim 1 of the ‘078 Patent recites a “signal” that is “received,” nothing in Figure 10 or the above-quoted disclosure in the specification justifies Defendants’ proposal that the term “signal type” must be associated with a signal that has been received, as

opposed to a signal that is “emanat[ing]” or that is being received. *See id.* at 3:30-31.

Nonetheless, Defendants properly propose that a “signal type” is associated not just with a user-selectable input device but rather with a *signal* from such a device. *See id.* at 3:30-43.


The Court therefore hereby construes “**signal type**” to mean “**a category of measurable variable input associated with a signal from at least one user-selectable input device.**”

V. CONCLUSION

The Court adopts the constructions set forth in this opinion for the disputed terms of the patents-in-suit. The parties are ordered that they may not refer, directly or indirectly, to each other’s claim construction positions in the presence of the jury. Likewise, the parties are ordered to refrain from mentioning any portion of this opinion, other than the actual definitions adopted by the Court, in the presence of the jury. Any reference to claim construction proceedings is limited to informing the jury of the definitions adopted by the Court.

Within thirty (30) days of the issuance of this Memorandum Opinion and Order, the parties are hereby ORDERED, in good faith, to mediate this case with the mediator agreed upon by the parties. As a part of such mediation, each party shall appear by counsel and by at least one corporate officer possessing sufficient authority and control to unilaterally make binding decisions for the corporation adequate to address any good faith offer or counteroffer of settlement that might arise during such mediation. Failure to do so shall be deemed by the Court as a failure to mediate in good faith and may subject that party to such sanctions as the Court deems appropriate.

So ORDERED and SIGNED this 12th day of May, 2014.



RODNEY GILSTRAP
UNITED STATES DISTRICT JUDGE